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AUTHOR Powell, Marjorie
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ABSTRACT

Although there are many qualifications, it appears from several major research undertakings that teacher behaviors are in fact related to student learning, but that specific behaviors may be less important than patterns of teacher behaviors and, further, that such patterns of behaviors are differentially effective for different students, grade levels, and subject matter areas. Teachers, to be effective when the criteria of effectiveness are related to student learning of basic skills, will organize instruction differently for different subject matter areas and for different grade levels. The important concern for student learning of basic skills at the elementary level is direct teacher instruction, which may involve different types of instructional organization. The important factor seems to be teacher instruction of the student and student attention to, and time spent on, instructional tasks. The organizational pattern and selection of materials that facilitate student attention to task and teacher involvement in instruction will be the most effective teaching procedures. Some research problems, such as measurement, are the concern of and need to be solved by researchers; others, such as the criteria of effective teaching, are the concern of and need to be addressed by all educators and concerned citizens. (Author/IRT)

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AMERICAN ASSOCIATION OF SCHOOL ADMINISTRATORS
108th Annual Convention
Atlantic City, N.J. February 20-23, 1976

SPEAKER: Marjorie Powell, Project Coordinator, California Commission for Teacher Licensing and Preparation, Sacramento, CA.

TOPIC: Teacher Competencies: California Beginning Teacher Evaluation Study

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The Commission for Teacher Preparation and Licensing is the California agency charged with responsibility for teacher certification and, therefore, with the responsibility for the establishment of standards for such certification. The Commission established guidelines for teacher education program plans for which would be submitted by Teacher Preparation Institutions for the approval of the Commission. Included within the guidelines were requirements that the teacher education programs specify the objectives which were held for the student, and the teaching skills which the program would convey to the teacher candidate. These were based on the premise that a teacher education program holds goals or objectives for the students enrolled in that program, and that at least some of the goals relate to the teaching skills which the developers of the program believe are important skills for new or beginning teachers to possess.

At the same time, the Commission attempted to identify some skills or objectives for teacher candidates that should be addressed in all programs of teacher education in California. The Commission discovered that, while they all believed in the importance of teachers, and of schools, as vital factors in the learning of students, they could not agree on the importance of specific teacher skills. The advice which they received from various individuals and groups in the field of teacher education was conflicting, to say the least. The research did not provide clear guidance. As a result, the teaching skills, understandings or competencies, and the objectives for students in teacher education programs, are quite general in nature.

At the same time, with funding from the National Institute of Education, the Commission undertook a massive research effort to identify some important teaching behaviors or skills, related to student achievement in reading and mathematics at the second and fifth grade levels. This appeared to be a fairly simple problem since we were limiting our concerns to reading and

mathematics at the elementary grades. Minor, in comparison to the difficulties involved in developing a system to evaluate teachers at all grade levels, incorporating a concern for student achievement in many curricular areas, and a concern for student progress in other areas, such as social development, and a concern for teacher performance in other professional areas, such as curriculum selection or development. True?

Yet each year the Commission learns that the simple task which it started in 1972 is more and more complex, and will take longer and longer to understand, to say nothing of solving. Each year the research becomes more focused, through a clearer definition of the problems and complexities, but each year the research appears, to many, to be further from any final, definitive information. Yet many of you know that the profession of teaching is much too complex to be understood in a few years, although we attempt to prepare teachers in a few years.

What have we learned, and what might be of relevance to school administrators? Enough of the introductions and background information. You now know that the research is funded by the National Institute of Education, being conducted by the California Commission for Teacher Preparation and Licensing to provide information to the Commission, in addition to that to which they already have access, in making policy decisions. The research is subcontracted, first to Educational Testing Service during one Phase of the study, and to the Far West Laboratory for Educational Research and Development at the present time.

I will now indicate some of the things which we have learned, and some of the ways in which they may be of interest to administrators, at both the school and the district levels.

The Competency Based teacher education movement has been among us for several years now. It has also resulted in strong opposing forces. I have

been one of those who has believed, and said, that the movement does not have a strong foundation in research, but that neither does a traditional teacher education program. We simply have not had a strong base of data and research on which to build any type of education program, competency based or other. I should point out here that this statement applies also to any attempt to evaluate teachers on the basis of performance.

On the other hand, I firmly believe that teachers are important to student learning and that, with the appropriate support from the school, the community, and parents and that teachers are responsible for student achievement in academic areas, along with many other responsibilities. However, I also recognize that we are nowhere near the point in time when we may be able to measure a teacher's impact upon student achievement sufficiently that we can use that information to make personnel decisions relative to individual teachers. We may be approaching the point in time where we can measure a teacher's impact upon student learning sufficiently so that we can make decisions regarding needs for teacher in-service and then can study the impact of that in-service training upon the teacher and the students. In other words, we may have enough general information about teaching so that we can begin to design some experiments which will provide us with further information.

What are the problems which arise when studying teaching? One problem is the selection, or determination, of the criteria of effective teaching. On a fairly gross level, this turns on the relative importance of academic or cognitive and affective student learning. Are you concerned that the teacher increase the cognitive learning of students within various subject matter areas, or are you concerned that the teachers have a positive impact upon the affective behavior of the students? Data from the evaluation of Follow-Through, conducted by the Stanford Research Institute (Stallings and Kaskowitz, 1974) indicate that those programs which focus, in the primary

grades, upon the acquisition of reading and mathematics skills result in higher learning of reading and mathematics on the part of the students, as measured by the standardized achievement tests used in the evaluation. On the other hand, those programs which emphasized student behaviors, such as ability to work independently, ability to work with other students, ability to solve problems, resulted in greater evidence of those behaviors on the part of the students enrolled in the programs. It is possible to measure the results of different emphases within programs, ignoring the question of the accuracy and reliability of the measures used.

If you focus on the area of student cognitive learning, there is still a problem of the selection of criteria of effectiveness. Do you mean student learning in all academic areas, or in a small number of important key areas, such as reading and mathematics? Let's say that you select reading and mathematics, and that we are talking about elementary school teachers and students. How, then, are reading and mathematics learning of the students combined into a criterion of an effective teacher? Are they equally important, so that you will sum the average measures of student learning in the two areas?

One thing which appears to be clear from several research projects is that the teacher behaviors which are related to student learning in reading are different from those which are related to student learning in mathematics. Let me go further. Within a curriculum area such as reading, the teacher behaviors which are related to student learning of word attack skills, or the ability to read and understand words which they have not read before, are different from the teaching skills which are related to student learning of comprehension skills. While this has one meaning and set of implications for those responsible for training or certifying teachers, it has a different meaning for teachers who are trying to improve the reading skills of their students and for administrators who may be developing an in-service education program or an evaluation system for teachers.

One meaning is that teachers will need to use different behaviors, teaching methods, possibly grouping practices, for teaching word attack and comprehension skills to students. Another meaning is that teachers may be differentially effective in teaching different types of skills to students. If different teaching behaviors are related to different student learning or different subcategories of the curriculum, or of a subject matter area, we must assume that teachers are differentially effective in the use of the different teaching skills. I as a teacher may be able to teach all of my students the word attack skills which they need, but I may not be able to teach them comprehension skills. If you use as a criterion of my effectiveness the total reading score of my students on some standardized test, and the test includes measures of student skill in word attack or phonics, and comprehension, what will you conclude about my effectiveness as a teacher of reading? And what will you know about how to help me improve my effectiveness through in-service education program?

Assume for the moment that you use the subject scores, so that you have some information about my relative effectiveness in word attack and comprehension. As a researcher, how would you combine these to determine whether I was effective or not effective? Is it helpful to know that one set of skills may be effective for the teaching of one subset of student learning in a subject matter area, and another set of skills is effective in another subset of the same academic area?

Let me complicate the picture further. The teaching behaviors which are effective for one set of students may be less effective for another set of students. In research terms, there is an interaction between the student characteristics and the teacher behaviors, which is, of course, compounded by the impact of the specific curricular area. Some of the work of Dr. Soar (1973) of the University of Florida and of Drs. Brophy and Evertson (1974) at the University of Texas indicate that different teacher behaviors are

related to achievement by different students of different socioeconomic groups, as indicated by membership or non-membership in ESEA Title I programs.

There is also evidence that the teaching skills which are effective at one grade level are different from the effective teaching behaviors at another grade level, although this difference might be a major one between primary and intermediate grades, rather than a difference between each grade. The Follow-Through data do not indicate strong differences for grade levels, while the BTES data indicate differences between grades 2 and 5.

Thus, from several correlational studies, it appears that different teacher behaviors are effective for different studies; different subject matter; specific instructional goals within a subject area; and for different grades; ages or developmental levels of students. An additional problem related to what one can say about effective teaching is that the variables, or teacher behaviors, may be related to student learning in a curvilinear manner, which is to say that some amount of a teacher behavior is effective for student learning, while more and less of the behavior is less effective. Praise is related to student learning, but too much praise may be as ineffective a teaching approach as too little praise. In fact, praise is related to student learning when it is praise associated with academic work, and when occasionally accompanied by negative comments. However, the point is that there may be some optimal amount of some teacher behaviors, and that simply increasing the behaviors which are related to student learning may not result in more student learning. Student time spent on academic work is related to student learning, but no one would want to say that students should spend all of the in-class time on reading and mathematics, or that the school day should be doubled.

Additionally, we do not know the optimal interrelationship among the teacher behaviors which appear to be related to student learning. If a teacher increases the use of one behavior which is related to student learning, this

may result in a decrease in other behaviors, some of which may be related to student learning. Thus, an increase in the amount of time devoted to reading may decrease the amount of time devoted to mathematics instruction. More time spent in teaching word attack skills may result in less time spent in teaching comprehension skills. The mix of teaching behaviors, or the patters of effective teacher behaviors, is a subject about which very little is known in the research community. The pattern of teaching behaviors may be more important than individual teacher behaviors. The analysis of the BTES Phase II data by ETS (McDonald, 1975) indicates that "differences in patterns of teaching performances account for differences in pupil learning." (page 15) Individual teacher behaviors showed weaker relationships to student achievement than did patterns of teacher behaviors, indicating that no single variable or teacher behaviors is crucial for student learning, but that patterns of teacher behaviors may be more or less effective.

However, I must point out the standard caution, that these results are from correlational studies, and correlation does not mean causation. In fact, the pattern of relationships between the teacher behaviors and student achievement may result from some other cause or causes. However, the identification of such results from several studies, using different data collection instruments, provides some indication of the strength of the relationship between teacher behavior and student learning.

On the other hand, in one special study of the BTES we have found some factors which are common among classrooms, and which are consistently found in classrooms where students have learned more in special short units. Some of these factors, or dimensions, are descriptive of the climate of the classrooms in which the students learned more in the short units; i.e., the extent of adult involvement in the classroom, the sense of conviviality and cooperation among students, engagement of the students in their tasks, and the promoting of self-sufficiency by the teachers. Other characteristics are

descriptive of the instructional methods of the teachers, and involve smooth transitions from one task to another, i.e., structuring of the lesson through indications to students of tasks to be completed and relationships of tasks to previous learning, attending to students and monitoring their work. The teachers in the classrooms where the students learned more on the short units were more accepting of students, consistent in the messages which they gave students when disciplining students, appeared to have a greater knowledge of the subject matter, and exhibited less behavior which appeared to be designed to result in their own recognition.

All of these need to be verified through further research, of course, but several of them are also related to other results which are consistent from study to study.

To summarize to this point, we have said that the criterion of an effective teacher needs to be defined carefully, by researchers as well as by administrators. We cannot assume that the teacher behaviors, or the teaching methods, which are successful for one goal of the school will be equally successful for other goals of the school. Many of the teaching behaviors are related to one type of student learning, within one subject area at one grade level for one type of student. These same teaching behaviors may not be related to student learning with different students, in a different subject area, or at a different grade level. The complexities of teaching are enormous.

This complex pattern of differential effectiveness of teacher behaviors may be one cause of another problem in studying teaching, whether the purpose of that study is scientific research, identification of in-service needs, or some other goal. Teacher behaviors may not be stable across time, even with the same group of students. This may be caused, in part, by the teacher's recognition that different teaching behaviors are effective for student learning within different parts of the curriculum. This, in my opinion, is one reason

for the limited relationships between teacher behavior and student learning in many studies in which teacher behaviors were counted in isolation. If I am concerned with a teacher's use of praise, or of thought-provoking questions, I need to be careful of how I measure the presence of those behaviors. Thought-provoking questions may not be appropriate when the instructional goal is practice on addition facts, or the multiplication tables. Praise may be more effective when used discriminantly, or when used in relation to successful academic work.

As I have indicated, the teaching behaviors which are related to student achievement with one group of students may not be the same as the behaviors which are related to student learning with another group of students. That may be one, but only one, of the reasons for another finding, which is that teachers have different patterns of achievement by students over different years. Teachers may not be consistently effective, or ineffective, across years. This information comes from two groups of studies, by Brophy (1973), and by Good (1975). In each study the researchers worked with teachers in districts where the same student achievement test had been administered for several years, and studied patterns of student achievement across several years, for each teacher. In some teachers' classrooms the students showed consistently high achievement over several years, while the pattern for other teachers was one of increasing achievement gains for students over several years. Still other teachers demonstrated fluctuating achievement gains, high some years and low others. The point is that we cannot assume that the achievement gain of a teacher's students for one year is a fair sample of the gain of students in that same teacher's classroom in other years.

With all of these cautions, that the research is still struggling with major definitional as well as measurement problems, let me indicate that we have learned something about the nature of effective teaching of the basic

subjects, reading and mathematics, at the elementary school level. These descriptions of effective teaching come from a number of studies, and not all of the descriptors can be found in any one study. The descriptors, or variables, were measured in different ways in the several studies, with different tests of student learning, and different student population included in the studies. However, the very fact that the descriptors or variables appear across several studies gives them a credibility which they would not have if they had been identified in only one study.

These descriptions of effective teaching behaviors can loosely be grouped under the heading of direct instruction. In some way, each of the behaviors contributes toward direct instruction of the students in the academic areas. Time is organized by the teacher, who also makes decisions related to instructional goals, materials, and student tasks and organizational groups. The focus of the classroom is on academic work, with sufficient time allocated for academic tasks. Movement from task to task is smooth, rather than abrupt, with the determination of when to move from one task to another made by the teacher on the basis of academic concerns, rather than on the clock, with little or no concern for whether students are at a point in the lesson where a shift would be productive. The goals of the instruction, set by the teacher, are clear to the student. The reacher structures the lesson to provide information to the student relative to the goals of the lesson, such as tying the lesson to previous work. The pace and difficulty level of the lesson are geared to the students, with the majority of questions being ones which can be answered with yes, no, or brief answers, questions which have a right answer. Most of the questions are of a difficulty level where most of the answers are correct. The student receives feedback from the teacher relative to the work; the student learns quickly whether his answer was right or wrong, although such information is not necessarily accompanied by praise. Praise, when given, is related to

academic work. The atmosphere of the classroom is not authoritarian; rather it is convivial, with students and teacher cooperating, although the teacher is in control of the activities of the classroom.

Time:

The amount of time which is devoted to academic work is an important variable in determining how much students learn. Several studies show inconsistent results when instructional time is related to student learning. However, Wiley and Harnischfeger (1974) report that the average number of hours of schooling per year was positively related to student verbal ability and achievement in reading comprehension and mathematics. The Follow-Through data reported by Stallings and Kaskowitz (1974) indicate positive, statistically significant, and consistent correlations between time devoted to academic concerns and student achievement in reading and mathematics. The Phase II data from the BTES indicate that the amount of time teachers spend organizing for instruction, within the fixed amount of time in the school day, is negatively related to student achievement (McDonald, 1975 b). The amount of time teachers spend teaching reading and mathematics is related to the amount of reading and mathematics students learn.

However, teacher allocation of time is only one aspect of instructional time in elementary school classrooms. Student use of time allocated varies from student to student, subject matter to subject and between organizational patterns. Several sets of data within BTES indicate differential utilization of time by students in different instructional groupings. At the primary level, in many classrooms, students do not appear to be engaged in their work when they are working independently. Berliner reports (1975) "Recently, in a suburban school, I clocked a typical child's active learning time during 45 minutes of seatwork on decoding skills that has been allocated by the teacher. The child was engaged with the learning task 3½ minutes. During a subsequent meeting a teacher

led a small group for developing reading skills, lasting 25 minutes, the child was apparently engaged 20 minutes." The pattern of movement from task to task within the time spent on academic areas is also important. Smooth transitions from task to task based on the completion of tasks rather than a fixed schedule set by the clock, are descriptive of classrooms in which students had higher achievement gains on short curriculum units (Tikunoff, et.al., 1975).

Group Size:

Stallings and Kaskowitz (1974), based on Follow-Through data, report consistent and often statistically significant negative correlations between achievement and children working along alone. Large group instruction, when a large group is designated as anything over 8 students, is related to student learning. Soar (1973), in analyzing data from Follow-Through classrooms, also reports that there is a positive correlation between achievement and children working in groups with a teacher supervising them and a negative correlation when children work alone without the supervision of the teacher.

However, if student independence is coded and counted only when students are attending to their independent work, there is a positive correlation with achievement. Independent work can result in student learning when the children attend to their work. This pattern of effective independent work, when the students are actually attending, is supported by data from Phase II, BTES, conducted by ETS (McDonald, 1975 b). In terms of reading at grade 2, independent seatwork for students is effective when it is accompanied by close supervision and by frequent interaction with the teacher. At the fifth grade level, extensive teacher interaction with students about reading materials is related to student achievement. For these purposes it appears that reading groups are effective when they serve to involve students in comprehensive discussion of materials read, but that individual student work and discussion with the teacher may be more effective.

In terms of mathematics, a mixture of types of instructional groupings is ineffective, while large group instruction appears to be ineffective at the second grade and effective at the fifth. At second grade, extensive student opportunity to apply and practice number facts, with feedback relative to the correctness of answers, either from the teacher or the materials, appears to be important for student learning. At fifth grade, the opportunity to work with mathematical concepts is important. Large group instruction, where students interact with the teacher relative to the concepts and teachers can keep students on task, appear to be an effective procedure.

Instructional Content and Materials:

There are several studies which indicate that the amount of content covered is related to student learning. The opportunity for a student to learn would appear to be logically related to the extent to which students do in fact learn. Harris (1968), studying low socioeconomic status or primary age pupils, asked the teachers to estimate the number of books read by pupils during individual reading times, and found the number to be correlated with student achievement. Pidgeon (1970) reports, in a study of 11 year olds in California and England, that the amount of mathematics content covered in second grade mathematics is light related to student achievement. This is also true for fifth grade mathematics.

The most effective pattern for utilization of materials differs between grade levels and subject matter. For reading in grade 2, according to Phase II, BTES, data, a variety of materials is related to student learning. However, the Stallings and Kaskowitz report indicates that the use of materials which are not directly academic in focus, such as games, is negatively related to achievement; the more time students spend playing games the less they learn. At the fifth grade level, the use of more materials is related to less student learning of reading comprehension, as reported by McDonald based on Phase II,

BTES data. The crucial factor for reading comprehension appears to be detailed study of fewer materials, rather than superficial reading of more materials. On the other hand, in mathematics the practice of number facts with many materials appears to be related to student achievement in second grade, based on data from Phase II, of BTES (McDonald, 1975 a).

Perhaps one crucial factor is the teacher management of multiple materials. If teacher time is devoted to organizing for instruction with many materials, the presence of the multiplicity of materials is harmful. A further concern may be that students become confused about both how they are to proceed with particular materials and the goal of the instruction, or what they are to learn. Teachers and students need to be aware of the purpose and procedures for the learning activity. Materials should support such awareness.

Teacher Questioning:

When researchers have studied the frequency of teacher questions, or the frequency of higher order questions which require the student to synthesize or evaluate information, the results in relation to student achievement have been confused and inconsistent. However, in the Follow-Through data, Stalling and Kaskowitz report a positive correlation between student learning and teacher questions which have an academic focus. Soar (1973) found that a pattern of drill and questions to which there is a single correct answer are usually positively related to student learning; drill is helpful to students in acquiring basic reading and mathematics skills.

Brophy and Evertson (1974) found mixed results, but usually a relationship between the percentage of correct answers and student learning. For students from low socioeconomic backgrounds, questions at a level of difficulty such that students answer a high proportion of the questions correctly is productive of student learning, while for students from higher socioeconomic backgrounds, questions which are slightly harder, to which students get a somewhat smaller proportion of correct answers, are related to student learning.

When researchers consider the proportion of questions which are factual in relation to questions which call for higher levels of student thinking, such as analysis and synthesis of information, the research results are confusing. Earlier correlational studies were inconsistent and marred by research design problems, so several experimental studies have been conducted which avoided these problems. However, the experimental results are equally confusing and inconsistent. There is little that can be said with confidence about the most effective mix of factual and higher cognitive level questions.

Praise and Feedback:

The pattern of relationships between praise, positive and negative feedback, and student learning, is equally confusing. It appears that praise and criticism, when focused on academic concerns, are related to student learning, as reported by Stallings and Kaskowitz (1974). Teacher praise or criticism, considered separately from its relationship to academic or non-academic concerns, is not directly related to student learning. Teacher response to students is often dramatically different from what the researcher may imagine prior to observing classrooms. One very common teacher response is to apparently ignore the student, by moving on to the next question. In analyzing the classroom observational data from one of the observation systems used to collect data in Phase II, BTES, Lambert (1975) reports, "The quality of teacher responses to pupil events is very similar across both grade and instructional areas .... About two-thirds of the time there is no teacher response to an observed pupil event." (page 72) This is, of course, particularly common in drill situations in which the teachers are asking frequent numerous fact questions of students. Teachers and students appear to accept this procedure, while researchers have not always accounted for such a teacher response. Differential patterns of drill procedures, and of responses to student partially correct answers, appear to be related to student learning, depending upon the socioeconomic level of the students (Brophy and Evertson, 1974; Soar, 1973).

Summary:

Thus, it appears, from several major research undertakings, that teacher behaviors are in fact related to student learning, but that specific behaviors may be less important than patterns of teacher behaviors, and further that such patterns of behaviors are differentially effective for different students, grade levels, and subject matter areas. Teachers, to be effective, when the criteria of effectiveness are related to student learning of basic skills, will organize instruction differently for different subject matter areas and when teaching different grade levels. The important concern, for student learning of basic skills at the elementary level, is direct teacher instruction, which may involve different types of instructional organization. The important factor seems to be teacher instruction of the student, and student attention to, and time spend on, instructional tasks. The organizational pattern and selection of materials which facilitate student attention to task, and teacher involvement in instruction, will be the most effective teaching procedures.

However, I must again point out that the majority of these studies focused on classrooms organized in the traditional pattern of many students per teacher; were limited to the elementary grades; focused on student learning of tool or basic skills in reading and mathematics, and excluded such concerns as student affective learning, initiative, independent work and creativity. They also made no attempt to compare dramatically different types of instructional organization, with the exception of the Follow-Through studies.

Continued research is necessary to continue to illuminate the importance of teachers to student learning, and to identify the many ways in which teachers have an impact upon student learning. At the same time, there is a need for at least some of this research to be conducted by policy making groups and to be, as a result, directed toward the concerns and questions of the policy makers rather than to the questions which may be of interest to the researchers. This involvement of policy makers, while insuring that the research is directed toward

questions which are of immediate concern, will focus the attention of the policy makers on the information which research does and does not have to provide to the understanding of education. Concurrently, care must be taken to educate policy makers to the vagaries of research, and the need for replication of findings from many cources. Nothing is so humbling to the researchers as an attempt to compile the findings from several studies, and interpret them for the policy maker or the implementer of such policy. One quickly becomes aware of the conflicting results, the problems, and the tentativeness of the research, and yet of the valuable partnership which is necessary between researchers, policy makers, and policy implementers if research is to have an impact and if students, teachers and administrators are to have the advantages of the knowledge which has been acquired by the researchers.

If I could leave one thought with you, it would be that there are many problems involved in research on teaching, in understanding the nature of effecti teaching. Some of them, such as measurement problems, are the concern of and need to be solved by the researchers. Others, such as the criteria of effective teaching, are the concern of, and need to be addressed by, all educators and concerned citizens.

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